REMARKS

Applicant has amended claims 1 and 18 to more particularly point out and distinctly claim the subject matter which he regards as his invention. Support for the amendment to claim 18 can be found in claim 21. No new matter has been introduced by the above amendments.

Claims 1-21 are currently pending. Reconsideration of the application, as amended, is requested in view of the remarks below.

Rejection under 35 U.S.C. § 112, first paragraph

Claims 1-17 are rejected as failing to comply with the enablement requirement. See the Office Action, page 2, lines 9-10. To support his rejection, the Examiner relies on relevant factors set forth in *In re Wands* 8 USPQ2d 1400 (CAFC, 1988), including: nature of the invention, breadth of the claims, state of the art, guidance of the specification, predictability of the art, and the working examples. See the Office action, page 2, lines 15-18. Applicant respectfully traverses below. Claim 1, an independent claim, will be discussed first.

Nature of the invention

The Examiner asserts that "the nature of the invention is extremely complex in that it encompasses a number of tumors or metastasis conditions and inhibiting the growth of the tumors, and further with a vast number of oligoaniline derivatives." See the Office Action, page 2, line 20 to page 3, line 2; emphasis added.

Claim 1 is drawn to a photodynamic method treatment. More specifically, it covers a method of inhibiting the growth of tumor cells in a tumor site in a subject by administering to the tumor site an effective amount of an oligoaniline and subsequently exposing the tumor site to irradiation. As pointed out in the response to the office action dated September 23, 2003 ("the last response"), oligoanilines are electron-rich and, upon irradiation, are capable of generating free radicals. These free radicals can then convert surrounding molecular oxygen to highly reactive oxygen radicals, which in turn attack and damage the tumor cells, thereby inhibiting their growth. Also see the Specification, page 1, lines 8-10 and page 3, lines 21-24.

Note that Applicant has removed from claim 1 the groups "-H and $-CH_2-CO-NH_2$" assigned to A and the groups "-SH, $-CONH_2$, and $-OCH_3$" assigned to D. Amended claim 1 recites oligoanilines in which the aniline nitrogen atoms are substituted with a hydrophilic group, such as -COOH, $-SO_3H$, and $-NH_3^+$. An oligoaniline containing such a hydrophilic group has improved water-solubility, and thereby possesses enhanced bioavailability. See, e.g., page 1, lines 10-12 of the Specification.

Thus, the nature of the invention is not "extremely complex" as asserted by the Examiner. To the contrary, the method of claim 1 is rather simple. Indeed, it is merely a simple method of non-discriminatingly attacking cells in a target site with free radicals generated by an oligoaniline upon irradiation, the oligoaniline being a simple compound containing hydrophilic groups.

Breadth of the claims

The Examiner then contends that "the complex nature of the claims is exacerbated by the breadth of the claims. ... the instant oligoanilines encompass a vast number of compounds." See the Office Action, page 3, lines 19-22; emphasis added. Applicant disagrees.

As discussed above, the method of claim 1 is rather simple. Further, claim 1 is not overly broad. Indeed, not only is claim 1 limited to compounds containing oligoaniline moieties, the oligoaniline moieties are further limited to those containing hydrophilic groups. These oligoanilines possess two common features, i.e., (1) capability of generating free radicals upon irradiation (due to the presence of electro-rich oligoaniline moieties) and (2) enhanced water-solubility and, thus, bioavailability (due to the presence of hydrophilic groups). Thus, all of the oligoanilines recited in claim 1 can be used to inhibit the growth of tumor cells in a similar manner, i.e., via a photodynamic method. In other words, the scope of claim 1 is not overly broad.

State of the art

The Examiner asserts that "[t]he state of the art does not recognize the administration of compositions that encompass the entire range of compounds to inhibit the growth of all types of tumors using a single compound." See the Office Action, page 3, lines 11-13.

Contrary to the Examiner's assertion, the state of the art does recognize the administration of a compound within the entire range of oligoanilines recited in claim 1. As mentioned above, all oligoanilines recited in claim 1 possess two common features, i.e., (1) capability of generating free radicals upon irradiation and (2) enhanced bioavailability. It is known that such oligoanilines can be used to inhibit tumor growths. See the Background section of the Specification.

Further, as pointed out in the last response, claim 1 does not cover a method of inhibiting growth of all types of tumor cells using a single compound. Rather, it only covers a method of inhibiting the growth of all types of tumor cells in a tumor site through the attack of free radicals generated by an oligoaniline upon irradiation.

Guidance of the specification

First, the Examiner points out that the "[i]nstant specification does not describe or teach how to prepare the compounds encompassed by instant oligoanilines ..." See the Office Action, page 3, lines 13-15. Applicant disagrees.

The Specification indicates that methods of making oligoanilines recited in claim 1 are well known. It has provided six documents[1] describing these methods (see page 4, lines 13-19) and an actual working example describing the synthesis of an oligoaniline recited in claim 1 (see Example 1). Thus, in view of the Specification, one skilled in the art would know how to prepare all of the oligoanilines recited in claim 1.

Second, the Examiner contends that the "[i]nstant specification only describes in vitro inhibition of murine sarcoma cells using sulfobuylated hexadecaaniline as an example representing the entire range of compounds claimed. However, applicants have provided no basis to extrapolate the efficacy of a sulfonylated hexadecaaniline as an example representing the entire range of compounds claimed." See the Office Action, page 3, lines 15-19. Applicants disagree.

Initially, Applicant would like to point out that, contrary to the Examiner's assertion, the Specification does not only describes *in vitro* assays (see, e.g., Examples 2 and 3) for inhibiting

[1] The content of these six documents are incorporated by reference in their entirety. See the Specification, page 6, lines 7-8.

murine sarcoma cells using a water-soluble sulfobutylated hexadecaaniline. Indeed, it also describes an *in vivo* assay (see Example 4) for inhibiting murine sarcoma cells in mice using the same compound. In any event, all of the oligoaniline compounds recited in claim 1 are capable of generating free radicals and have improved water-solubility. See the Specification, page 1, lines 8-10 and page 4, lines 13-16. Thus, contrary to the Examiner's assertion, the Specification has provided a basis to extrapolate the efficacy of water-soluble sulfobutylated hexadecaaniline (which is capable of generating free radicals upon irradiation) to the efficacy of other water-soluble oligoanilines (which are also capable of generating free radicals upon irradiation).

Third, the Examiner points out that "applicants have not described if all of the different types of oligoanilines that result from the instant claim 1 would possess the ability to get photo-excited and convert molecular [oxygen] to singlet oxygen and related free radicals and that all the resulting compounds are effective in inhibiting the tumor cell growth." See the Office Action, page 4, lines 8-11. Applicant again disagrees.

As mentioned above, the Specification points out that all oligoanilines are electron-rich molecules, and therefore possess the ability to get photo-excited and generate free radicals. Thus, they can all be used to inhibit tumor cell growth following the method of claim 1. The efficacy of these oligoanilines is further improved by incorporation of hydrophilic groups to increase their water solubility.

Working examples/undue experimentation

Applicant has provided four working examples (i.e., Examples 1-4). Nonetheless, the Examiner asserts that "the practitioner would turn to trial and error experimentation to make/use the instant compositions with a different oligoaniline compound and test its efficacy for inhibiting the growth of different types of tumor cells, at different stages of growth cycle, without guidance from the specification or the prior art. Therefore, undue experimentation becomes the burden of the practitioner." See the Office Action, page 4, line 19 to page 5, line 2; emphasis added. Applicant disagrees.

As pointed out in the last response, "[a] considerable amount of experimentation is permissible, if it is merely routine, or if the specification in question provides a reasonable amount of guidance with respect to the direction in which the experimentation should proceed

(emphases added)." In re Wands, 8 USPQ2d 1400, 1404 (CAFC 1988), citing In re Jackson, 217 USPQ 804, 807 (CCPA 1969).

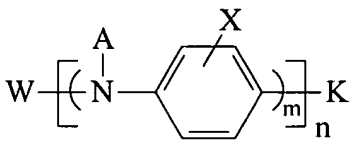
As mentioned above, the Specification points out that methods of making oligoanilines recited in claim 1 are routine. See page 4, lines 13-19; in particular, the six documents cited therein. In any event, Applicant has provided one working example (Example 1) that describes a method of making an oligoaniline. Further, as pointed out in the last response, photodynamic therapy was well known at the time the invention was made. It is a mere routine procedure to use different oligoanilines recited in claim 1 and test their efficacy in photodynamic therapy. Even if the photodynamic therapy is not a routine procedure, the Specification has provided a reasonable amount of guidance including three actual working examples, Examples 2-4.

It is submitted that claims 1-17, not subjected to other grounds of rejection, are now in condition for allowance.

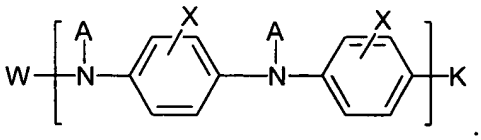
Rejection under 35 U.S.C. § 102(b)

Claim 18 is rejected as being anticipated by Wai et al., EP 507 488 ("EP '488"). See the Office Action, page 5, line 9.

Amended claim 18 covers a pharmaceutical composition containing an oligoaniline of formula (I):



(I),

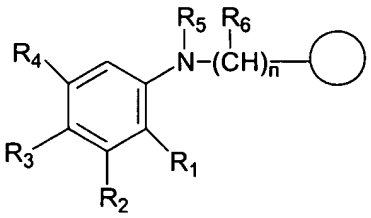
in which m, n, A, W, X, and K are defined in claim 18. More specifically, Applicant has assigned "2-6" to m recited in claim 18 to more particularly point out that this claim covers a composition containing an oligoaniline. As an example, when m is 2 and n is 1, the compound of claim 18 is a dianiline having the formula: 

. In this compound, one of the aniline nitrogen is bonded to aminoaryl. Clearly, when m is 3-6, two or

more aniline nitrogen atoms are bonded to aminoaryl. In other words, all of the oligoanilines recited in claim 18 contain at least one aniline nitrogen that is bonded to aminoaryl.

The Examiner points out that "EP teaches variables R_1, R_2, R_3, R_5, and R_6 can be H. Instant variables K, A, and X can be H. With respect to claimed variable W, instant claim states that W can be CH_2-B, where B can be an aryl group. Given R_6 of EP is H atom, then the attachment on N of EP will be $(CH_2)_n$-aryl, thus reading on the instant compounds." See the Office Action, page 5, lines 14-17.

EP '488 discloses aniline derivatives of the following formula:

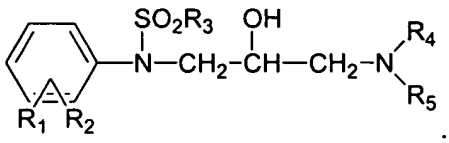


In this formula, R_5 is H or C_{1-2} alkyl and the group  is aryl or heterocycle. Thus, the aniline derivatives disclosed in EP '488 contain an aniline moiety in which the aniline nitrogen is substituted with alkyl and arylalkyl (when R_5 is alkyl and  is aryl). EP '488 does not disclose an oligoaniline, in which at least one aniline nitrogen is bonded to aminoaryl, as required in an oligoaniline compound of claim 18. Claim 18 is therefore not anticipated by EP '488.

Claims 18-21 are rejected as being anticipated by Descamps et al., U.S. Patent 4,330,542. See the Office Action, page 6, lines 1-2.

The Examiner points out that "Descamps teaches a sulfonyl derivative attached to N and thus reads on the instant claimed compound." See the Office Action, page 6, lines 6-7.

Descamps discloses aniline derivatives of the following formula:



In this formula, the aniline nitrogen is substituted with sulfonyl and aminoalkyl. Descamps does not disclose an oligoaniline, in which at least one aniline nitrogen is bonded to aminoaryl, as required in an oligoaniline compound of claim 18.

Claim 18 is therefore not anticipated by Descamps. Neither are claims 19-21, all of which depend from claim 18.

CONCLUSION

Applicant submits that the grounds for rejection asserted by the Examiner have been overcome, and that claims 1-21, as pending, define subject matter that is enabled and nonobvious. On this basis, it is submitted that all claims are now in condition for allowance, an action of which is requested.

Pease apply any other charges to deposit account 06-1050, referencing Attorney's Docket No.: 06897-006001.

Respectfully submitted,

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